Our evolution unit plan presents, over the course of the study period, the origins, development, and current understanding of evolution. It covers aspects of science history, genetics, taxonomy, molecular biology, biochemistry, and ecology. Specific lessons will cover many, if not all, of the following topics:

•Explain how theories of gradualism and uniformitarianism influenced Darwin’s ideas about evolution.

•Describe Lamarck’s explanation of how adaptations evolve and compare it to Darwin’s.

•Explain the tenets of Darwin’s theory of evolution by natural selection, using Darwin’s and modern examples.

•Explain evolution by natural selection through a series of simulations and labs

•Use the Hardy-Weinberg theorem to calculate allele, genotype, and phenotype frequencies in a population at equilibrium, and describe and explain the conditions that violate this equilibrium through a lab. Describe the usefulness and limitations of the HW model.

•Explain how genetic drift, gene flow, mutation, nonrandom mating, and natural selection lead to evolution within a species as well as speciation. Explain and give examples of the three types of selection.

•Explain the causes of genetic variation – mutation, recombination (delayed until genetics units), sexual reproduction – within a population and the prevalence of sexual reproduction as a way of providing variation through a reading, video, discussion, and simulation. Explain how sexual selection contributes to evolution.

•Define, compare/contrast, and give examples of adaptive radiation, convergent and divergent evolution; allopatric, sympatric and parapatric speciation; gradualism and punctuated equilibrium.

•Describe how the following gives evidence of evolution: embryology, fossils, homology, vestigial organs, and biochemistry.

•Define the biological species concept and describe the limitations of the concept.